CHAPTER 2: REVIEW OF RELATED LITERATURE

2.1. Introduction

A sound review of related literature is necessary for establishing the foundation of any research study. It not only provides a conceptual and theoretical background to the study but also helps in identifying research gaps, methodological trends, and the scope of the problem.

A thorough literature review is essential for anchoring the current study within the broader framework of existing academic work and policy guidelines. This chapter encompasses significant Indian and international literature, theoretical inputs, along with policy documents like NEP 2020, NPE 1986, and NSF reports, providing insights relevant to students' interest in mathematics and school environment, also how school environments influence students' academic interests, especially in mathematics.

The review of literature highlights the multidimensional relationship between students' "interest in mathematics" and the "school environment" across different

2.2 Educational Policies and Frameworks Related to the Study

National Education Policy (NEP) 2020; The NEP 2020 emphasizes the importance of foundational numeracy and mathematical thinking in early education. It recommends experiential and activity-based pedagogy and promotion of mathematical and scientific temper in mathematics and highlights the need to create joyful, inclusive, and engaging classrooms. It recognizes the need for teacher training and school climate improvement to foster better learning outcomes. It also emphasizes learner-centric education with special focus on critical thinking, conceptual clarity, and joyful learning. It also highlights the importance of safe and inclusive school environments, stressing on socio-

emotional and cognitive development of students—core to shaping their subject interests.

National Policy on Education (NPE) 1986; NPE 1986 (modified in 1992) advocated improvement in the quality of education, including emphasis on science and mathematics. It underscored equal access and removal of disparities, and called for enhancing school conditions—both physical and emotional—as essential to academic outcomes.

The NPE 1986 (revised in 1992) emphasizes removing disparities in education and also encouraging scientific temper, and highlights the importance of logical thinking and a supportive environment. It recognizes the importance of school infrastructure, qualified teachers, and the overall climate for effective learning, including subjects like mathematics.

National Curriculum Framework (NCF) 2005; NCF 2005 identified fear and disinterest in mathematics as systemic issues. It proposed child-friendly teaching, understanding-based assessment, and a classroom environment conducive to exploration and discussion, which can significantly boost student interest in subjects like mathematics.

NCF 2005 strongly advocates learning mathematics as a reasoning skill and the need for improved school climate. Also strongly advocates for mathematics to be taught as a means of developing logical and analytical reasoning, rather than rote memorization. It also calls for improvement in school climate by integrating classroom interactions, gender sensitivity, and joyful learning practices.

National Science Foundation (NSF) Reports; NSF-supported studies in the U.S. and India's versions have emphasized that early exposure to mathematics in supportive environments builds confidence and deepens engagement. It shows strong correlation between learning environments, teacher effectiveness, and student interest and achievement in STEM subjects, particularly mathematics. The NSF also stresses creating equitable learning environments and developing students' intrinsic motivation in STEM fields.

National Achievement Survey (NAS); The NAS has repeatedly highlighted differences in mathematics achievement based on school types and regions, attributing gaps in learning outcomes to varied school environments, pedagogy, and teacher support systems. Points to disparities in math learning linked to school climate and teaching quality.

2.3 National Studies

Review of Related Indian Literature

Hoor Jahan Hasan (2016) Associate Professor; Anjuman-I-Islam‟s Akbar Peerbhoy College of Education, Vashi Explored vocational interests and school environment, affirming that positive school environments foster deeper engagement across academic disciplines.

Selecting a career is one of the most significant decisions made by high school students. Selecting a course of study determines future education and, in turn, what young people will do with their lives. It establishes not only their earning potential but also, frequently, their social and economic standing. While many other nations permit students to postpone difficult decisions until later in life, typically until their senior year of college and occasionally even beyond, Indian high school students' choices are much strict than those made in other nations. The rigidity has sound structural explanations. More flexibility in the higher education system is necessary in order to provide students with flexibility in the future. The college would need to

figure out how to get more students accepted based on the delayed choice, students in one discipline over another. This type of flexibility is costly, and it can be challenging to make the required investment in societies with limited capital. This implies that the decisions high school students make about their studies have a significant and cascading effect. Students must make wise decisions early on because it is difficult to switch their field of study later. With the expansion of the Indian economy and the emergence of new opportunities, the significance of career counselling has only grown in recent years. These opportunities emerged not only in high-investment learning domains like technology but also in low-investment domains like retail and real estate. income families, but they must learn to make the right decisions. However, it is difficult to assume that teenagers are mature enough or have a comprehensive enough world view to make informed decisions about their future careers. Therefore, the challenge is for schools and families to support youth in making these decisions as thoughtfully as possible. When making decisions, formal career counselling is crucial. But what values ought to direct parents or career counsellors when they offer guidance? This essay aims to comprehend the causes of students' interest in careers. In particular, it contrasts professional interest with personal In particular, it contrasts personal values and the educational setting with regard to vocational interest. Better career advice distribution should be made possible by the study's findings.

Sherafat & Murthy (2016) Compared critical thinking skills of government vs private school students, showing that private school students performed better in logical reasoning skills due to better learning climates and study habits, indicating a stronger mathematical base possibly due to a more favorable learning climate.

linking better outcomes to superior environments in private institutions. Sherafat & Murthy (2016) compared critical thinking skills of the government against private school

students, showing that private school students performed better in logical reasoning skills due to better learning environments and study habits, indicating a stronger mathematical basis maybe due to a more favorable learning environment. The study was conducted on a sample of 625 students in Mysore City, India, using a stratified random sampling technique. The authors' goal was to determine whether or not students in government and private schools differed in their critical thinking and study habits. The results showed that students in private schools had better study habits and critical thinking abilities than students in government schools, indicating that private institutions have certain advantages over government institutions.

Vandana Sharma (2017); Her comparative study on VIII standard students observed differences in mathematical interest based on school type, supporting that private schools with supportive environments may foster more interest in mathematics. She concluded that mathematical interest varies significantly across schools, suggesting that school environment is a dominant influence on academic motivation.

The classroom environment plays a pivotal role in shaping students' academic experiences and overall engagement. This research paper explores the intricate relationship between classroom environment and student engagement, with a focus on primary and secondary education settings. Student engagement is a multifaceted construct encompassing cognitive, behavioral, and emotional dimensions. The quality of the classroom environment, including physical layout, teacher-student interactions, and classroom management practices, significantly influences these dimensions of engagement. Through a comprehensive review of existing literature, this paper examines the key factors contributing to an engaging classroom environment. It

highlights the impact of factors such as classroom design, seating arrangements, classroom resources, and the use of technology on students' cognitive engagement. Additionally, the role of teacher-student relationships, instructional methods, and classroom climate in promoting behavioral and emotional engagement is explored. Furthermore, this research investigates the potential challenges and barriers educators may encounter in creating and maintaining an engaging classroom environment. Factors such as classroom size, resource limitations, and diverse student needs are discussed in relation to their effects on engagement. The paper also delves into the implications of an engaging classroom environment on students' academic achievement, motivation, and well-being. It emphasizes the importance of fostering a positive and inclusive classroom culture that caters to individual learning styles and needs. In conclusion, this research underscores the significance of the classroom environment as a dynamic and influential factor in students' educational experiences. Understanding the relationship between classroom environment and student engagement can inform educators, policymakers, and school administrators in creating an environment.

Naresh Gandhi (2017): National Journal of Multidisciplinary Research and Development; In his study titled “Study of Educational Interest in Relation to School Environment”, Dr. Naresh Gandhi examined the correlation between educational interest and school environment among 100 IX-grade students. The findings revealed significant positive correlation ($r = 0.26$) between educational interest and school environment, supporting the idea that an engaging school environment significantly impacts students’ interest in academics. This highlights that as the quality of the school environment improves, so does student interest in academics

Tools used were the “Educational Interest Record” and “School Environment Inventory”. The findings strongly support the notion that an enriched school environment improves students' interest levels. It underlines the need for proper classroom arrangements, engaging displays, and meaningful teacher-student interactions.

Implication for Current Study: Validates the hypothesis that the school environment plays a crucial role in shaping mathematical interest. It also supports the use of correlation analysis for verifying the relationship.

Emphasized educational interest is influenced by school environment and classroom practices.

Recommended school heads focus on building a more emotionally and academically supportive climate.

Luckey Singh (2019); Found that a direct link between teachers’ professionalism and school climate positively affects’ students' performance in science and mathematics. The administrative effectiveness of the school head also influenced school climate significantly.

Kumar, Mukesh (2020); the finding of study “ACHIEVEMENT IN

MATHEMATICS IN RELATION TO ATTITUDE TOWARDS MATHEMATICS,

METACOGNITION AND LEARNING STYLES OF NINTH CLASS STUDENTS

OF DISTRICT KAPURTHALA (PUNJAB)’” revealed there was influence, significant contribution and positive correlation of attitude towards mathematics, metacognition and some learning styles.

Dr. Nidhi Shukla (2020); In her research "A Study of Academic Achievement of Secondary School Students in Relation to Their Home Environment and School Environment", Shukla found gender-based differences in school environment perception, and emphasized that school climate directly impacts students' academic motivation and interest

Demonstrated the significant role of school and home environments on student academic success. Found that home and school environments both significantly impact academic performance; supports use of t-test, correlation, and group comparison techniques methods used in this dissertation.

Reinforced that gender, school type, and family involvement impact student achievement and interest.

Her research concluded that both home and school environments play a pivotal role in determining student academic success.

Ruchi Setia & Dr. Rajiv Ranjan (2023); In their correlative study, they found that study habits and school environment both impact academic achievement, with clear implications for mathematics interest and performance. Linked the study habits and school environment with academic achievement, emphasizing the correlational strength between environment and motivation.

Kanchan Bala (2023) – IJCRT Journal; This study focused on "gender and problem-solving ability in relation to mathematical interest" among 206 high school students. Using the "Mathematical Interest Inventory" by L.N. Dubey and a standardized problem-solving test, it concluded:

No significant differences in mathematical interest based on gender, or No significant interaction between gender and problem-solving ability

Problem-solving ability did not significantly affect interest

Indicating that pedagogical practices and school support matter more than innate traits.

Implication for Current Study: Challenges the gender assumption in mathematical interest. It reinforces the idea that teaching approaches and learning environments might be more influential than innate gender-based differences.

Mohamed Illiyas & Dr. M. Aron Antony Charles; Their study emphasized the relationship between students' academic performance and their interest in mathematics, asserting that interest develops more in schools with a stimulating classroom climate and teacher support. Their work in Chennai highlighted that interest in mathematics is positively associated with academic achievement, but classroom environment and teaching methods are pivotal in nurturing this interest.

Note that academic success in math correlates with supportive teaching environments.

Dr. Rishikesh Mishra & Mr. Bakkas Ali; Reported that school climate impacts both student learning and teacher burnout.

Explored the impact of organizational climate on teacher burnout, showing that a healthy environment not only benefits students but also enhances teacher motivation, which indirectly benefits classroom learning in subjects like mathematics.

2.4 International Studies

Review of Related International Literature

Uitto & Saloranta (Finland, 2010); Studied environmental values and interests, showing that students' interests are molded by the cultural and educational climate, indicating the universal impact of school environments. Found interest and attitudes linked to academic and social climate. They established connections between students' personal values, motivations, and interests with respect to environmental and academic factors, reinforcing the importance of a conducive school climate.

Odeh et al. Oguche & Ivagher (2015, Nigeria):; A large-scale study in Nigeria linking academic achievement with school environment, reinforcing that students exposed to well-structured and motivating environments excel more academically.

Their study confirmed that students from well-managed, emotionally supportive schools perform better and exhibit higher subject interest. Their findings established that academic achievement Strong correlation between academic success and school environment in under-resourced settings, correlates significantly with school environment, particularly in resource-constrained settings where teacher support and classroom facilities vary widely.

Quenie S. Romorosa et al. (2021, Philippines); Studied school environment and student engagement in private schools and found that positive school climate enhances academic motivation student engagement, especially when learning is collaborative and inquiry-based. and also found that a positive emotional and academic climate enhances interest in all subjects, including mathematics.

Salifu & Bakari (2022) ; Founds moderate positive correlation between students' interest and performance in mathematics, especially in positive learning environments. Also founds that school leadership and structured environments significantly enhance

academic engagement and subject interest, especially in mathematics. Their research affirmed that good school environments encourage critical thinking and sustained mathematical interest. Also explored the role of perception and environment in shaping interest and achievement.

Angelo C. Gutierrez Jr. & Romulo G. Doronio (2024); Their recent correlational study titled "Classroom Social Environment and Student Engagement in Mathematics" from the Philippines found that classroom climate and peer interaction strongly relate to math engagement. And also confirmed a strong association between positive classroom environment and high engagement in mathematics, regardless of socioeconomic status. They concluded that classroom social environment and teacher encouragement significantly boost engagement in mathematics classes.

2.5 Other Supporting Studies:

Kumaran, D. (2001); Studied organizational climate and academic performance at the higher secondary level, emphasizing how institutional structure and leadership affect student outcomes.

Goswami (2001); His experimental work on creating environmental consciousness underlined the role of schools in shaping cognitive and emotional engagement, indirectly pointing toward school climate's effect on interest in STEM.

Acosta, E. S. (2001); In her doctoral dissertation, Acosta examined the relationship between school climate, academic self-concept, and achievement, concluding that a positive school climate enhances both academic performance and interest in learning.

Deluca, H. M. (2003); Explored how school environments influence eating behavior, body image, and social concerns, suggesting that environmental settings deeply impact student psychology and comfort, indirectly influencing subject interest.

Saha, K. (2005); Demonstrated that school environment significantly influences cognitive development in children, which has a direct impact on their interest and performance in subjects like mathematics.

Narula, N. (2007); Focused on mathematics achievement in relation to emotional intelligence and learning style, which reinforces the idea that non-cognitive factors such as interest, environment, and personality traits significantly affect learning in mathematics.

Mumthas & Abdual J. K. (2008); Conducted a regression analysis showing school leadership and organizational climate as key factors in academic engagement and teacher performance.

Uitto & Saloranta (2010); Their international research emphasized personal motivation, interest, and social values as deeply connected to learning context and classroom engagement.

Yadav & Yadav (2012); In a comparative study of boys and girls in Gurukuls, the authors found that vocational and academic interests were strongly influenced by the learning environment, teacher support, and classroom methods.

Sarmah & Hazarika (2012); Found boys had more interest in mathematics, but school type (public vs. private) showed no significant difference.

2.6 Gaps in the Literature

While many studies establish the importance of school environment, few directly linked it with mathematical interest of student’s

Comparative studies between CBSE and State Boards are rare.

Limited research exists combining gender, school type, and board affiliation as multiple variables.

2.7 Summary of Literature Review

Literature shows that students' interest in mathematics is affected by personal and external factors, with school environment being a key influence. Gender-based differences are usually minimal, but school type and board affiliation show meaningful variation. Positive school climates are strongly associated with higher academic interest and performance in mathematics.

The literature collectively indicates that:

Mathematics interest among students is shaped by a mix of individual factors (motivation, gender) and external environmental factors (teaching quality, school climate).

School environment is a consistent predictor of academic engagement and interest, with numerous studies emphasizing its influence on mathematics learning outcomes.

Studies reviewed show that gender-based differences are often insignificant, but school type and board affiliation do show meaningful variation.

A positive correlation exists between school climate and academic interest, as supported by both national (Gandhi, Shukla) and international literature.

This literature review clearly reveals that the school environment—ranging from teacher-student relationships to physical infrastructure—has a significant impact on students' academic interests, particularly in mathematics. Indian and international studies both confirm that a supportive, well-managed educational setting correlates with higher interest and performance. The current study fills a crucial gap by analyzing multiple variables (gender, board type, and school types) in relation to their school environment.